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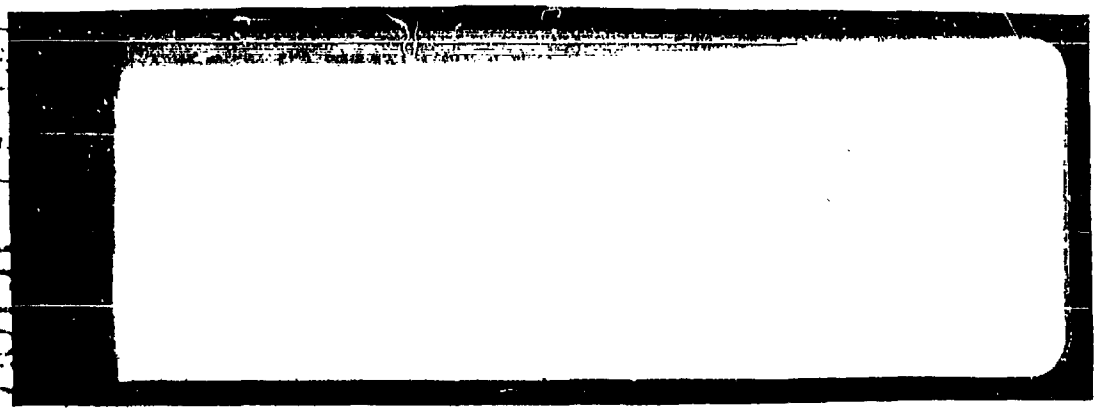

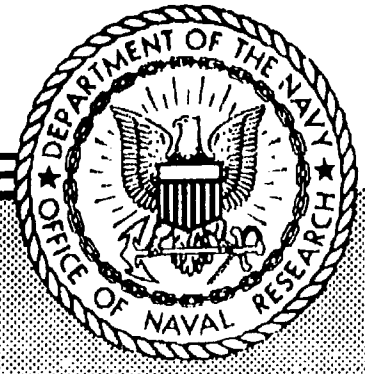

SPECIAL DEVICES CENTER

PORT WASHINGTON, L.I., N.Y.

TECHNICAL REPORT - SPECDEVCEN 269-7-51

TRAINING FILM EVALUATION: FB254 - COLD WEATHER UNIFORMS

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SPECDEVCEN Project 20-E-4
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20 August 1954

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SPECIAL DEVICES CENTER
OFFICE OF NAVAL RESEARCH
HUMAN ENGINEERING DEPARTMENT

Problem:

The purpose of this study, which was done at the request of the Department of the Army, was to discover whether a humorous approach in a training film affects learning. In the film FB-254, Cold Weather Uniforms, a bumbling central character made errors and was corrected by an off-stage narrator in the typical "Pete Smith" approach. The purpose of this evaluation was to determine any difference in teaching value of this film as compared with a film having the same instruction presented in a straight-forward, interesting manner without the "Pete Smith" approach.

Results:

1. There was no significant difference in learning between the original film and one in which the "Pete Smith" effects had been deleted.

2. Trainees learned significantly more from the film when the "Pete Smith" effects were deleted and printed titles indicating the main topics to be covered were substituted in their place.

3. Trainees who saw the humorous version and also the "titles" version of the film tended to prefer the film they saw last, regardless of which one it was.

Recommendations:

The additional cost and effort of including "Pete Smith" effects in a film cannot be justified on the basis of increased learning. Other film techniques such as the addition of organizational titles can be justified where humor cannot.

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TRAINING FILM EVALUATION--
FB254 COLD WEATHER UNIFORMS
AN EVALUATION OF SPECIAL EFFECTS AND APPEALS

by

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INTRODUCTION

The film Cold Weather Uniforms is distinguished primarily by the liberal use made in its production of so-called "Pete Smith" effects. These effects may be characterized by: 1) the apparent stupidity of the principal character or protagonist, 2) talking down to the protagonist by the commentator and, principally, 3) the use of trick photography and editing, e.g., speeded motion (so that action goes very rapidly), reverse motion (so that an action is reversed by causing it to appear to run backwards), and the unusual juxtaposition of shots (so that a person might appear to be sitting on a bed in one instant and on a piece of ice in the next, or fully clothed one instant and only partially clothed the next).

The primary problem under investigation was whether such effects or production techniques had any appreciable influence upon learning from the film or upon trainees' acceptance of the film. In order to test this, another film, described in greater detail below, was prepared from a print of the original film, i.e., FB254, in which the Pete Smith effects were removed and printed titles inserted in their place to cover the breaks in continuity. The two films were compared on the basis of an objective test of fact and a subjective measure of trainee opinion.

An additional problem studied was the effect upon learning of simply removing the Pete Smith effects and inserting blank leader in the film, instead of titles, to cover the breaks in continuity. It was believed that the findings relative to this might have implications beyond the present study. In conventional film production, much effort is expended to insure that there are no serious breaks in continuity between sequences and that no "jump cuts" occur. It was believed that this portion of the study might yield information to indicate whether breaks in continuity might be covered by simply inserting blank film between sequences which are not matched for action, without seriously hindering the teaching effectiveness of the film. It would appear that this might have important implications, particularly for minimum film production.

Finally, an effort was made to determine the relative interest and probable teaching effects of the two films as subjectively perceived by trainees. That is, both the basic film and the film with titles inserted were shown consecutively to groups of recruits who were instructed to compare them on the basis of a number of questions designed to tap subjective reactions to the films. This is discussed later in the report under the heading "Paired Comparisons."

PROCEDURES

The Film Versions

1. FB254 Cold Weather Uniforms: This film, hereafter referred to as the base version, demonstrates the various items of clothing in the cold wet and cold dry uniforms. Their merits and limitations are pointed out and their appropriate use and care are emphasized. For the greatest part, the action occurs in a barracks apparently located in a cold climate. One individual, Joe, demonstrates the clothing at the suggestion of an off-stage commentator. Joe is portrayed as a somewhat stupid individual and is used as a foil for the commentator who deals with him with patient patronage. In an apparent effort to increase audience interest a number of trick photographic and editing effects are introduced. For instance, Joe's clothing pops on or off; water is thrown on his feet and, by running the footage backward, is made to disappear; Joe sits on a cot only to find that it is a block of ice; and from time to time, by speeded-action photography, Joe is made to move with exaggerated speed. To all of these occurrences, Joe reacts with appropriate amazement and stupefaction.

2. FB254 Cold Weather Uniforms--Modified, Titles: This film is hereafter referred to as the titles version. An analysis of the base version showed that, in general, the special photographic and editing effects occurred just before the introduction of a new article of clothing or a new idea and that no essential information was conveyed by them or by the protagonist's (Joe's) reaction to them. Therefore it became quite feasible to remove physically those effects from the film. However, to have simply spliced the film together after removing the special effects would have resulted in disruptive breaks and jumps in the continuity of the film. Therefore, to cover these, printed titles which simply indicated the next article of clothing or idea to be discussed were inserted in the film at the places where the cuts had been made. It should be noted that while the titles actually were inserted to cover the breaks in continuity caused by cutting out the trick effects, the apparent reason to the viewer for inserting titles was that they served to organize the film and orient the learner to the next topic to be discussed.

The commentary was re-written and re-narrated so as to reflect the new organization of the film and to delete the humorous and deprecating remarks made to Joe. In general, however, the commentary was very similar to the commentary of the base version with the exception of the changes just mentioned. The titles were read aloud by the commentator.

The base version is introduced by a "motivating" sequence showing examples of cold weather and the effects of frostbite and trench foot. This was not changed in the modified version except that the commentary was spoken by the same person who narrated the modified version who, of course, was different from the original commentator. No test questions were asked with respect to this portion of the film.

3. FB254 Cold Weather Uniforms--Modified, No Titles: This film will be referred to hereafter as the no titles version. It is identical to the titles version except that blank film was inserted in place of the titles. The commentary was identical.

The Experimental Population

Subjects used in the experiment were 426 trainees in their eighth week of training in the Ordnance Recruit Training Command, Aberdeen Proving Ground. The number of trainees distributed by treatments is shown in Table 1.

TABLE 1

NUMBER OF TRAINEES RECEIVING EACH TREATMENT[1]

Treatment	N
Base Version	99
Titles Version	87
No Titles Version	95
Control (No Film)	50
Paired Comparisons (Base followed by Titles)	34
Paired Comparisons (Titles followed by Base)	61
Total	426

[1] For a further description of the treatments, see the section below entitled Test Administration.

In all but the Control and Paired Comparisons (Base and Titles) treatments two platoons were tested. However, only 14 men of one platoon were present for the other Paired Comparisons treatment, the remainder being detained by a dental check.

The trainees were assigned to the various treatments by intact platoons. Ten platoons from two and one-half companies were used. Four platoons were tested the first week, two the second week and four the third week.

Trainees had been assigned alphabetically to platoons within a company by the Ordnance Recruit Training Command. It was assumed therefore that individual differences among trainees would be distributed randomly among the platoons and, therefore, among the treatments. An analysis of variance of the trainees' scores in Area I of the Army Classification Battery did not reveal any significant differences among platoons.

No trainees in the experiment had had prior instruction on Cold Weather Uniforms. However, at the time the experiment was planned, the film Cold Weather Uniforms was being shown to recruits as a part of their regular basic training. However, at the time the experiment was conducted the film was no longer being used in basic training.

The Tests

1. Information Test: The information test consisted of 64 four-choice paper and pencil type questions on information presented in the films. Twenty-seven of these consisted of the names of articles of clothing which the trainees had to indicate were worn with: a) the cold wet uniform, b) the cold dry uniform, c) both the cold wet and cold dry uniform, or d) neither of these uniforms. The remaining items dealt primarily with matters of fact presented in the film regarding the salient characteristics of various articles of clothing and their appropriate use. The items were checked carefully for accuracy against the base version which was assumed to be technically correct.

Several weeks prior to the main experiment, the test was administered to 98 trainees (two platoons) in their eighth week of training at the Ordnance Recruit Training Command, Aberdeen Proving Ground. On this administration of the test its odd-even reliability coefficient, corrected for the length of the test, was found to be $r = .81$.

2. The Opinion Questionnaire: The questionnaire used in the paired comparison test consisted of the following eleven questions:

1. Which film did you like the better?
2. Which film was the more interesting?
3. From which film do you think you learned the most about cold weather clothing?
4. Does it bother you or make you angry when a training film makes the main character, a soldier, seem foolish or stupid?
5. Did Joe, the main character, seem foolish or stupid in either of the films?
   If "Yes", in which film did he seem stupid?
6. Which film did you think was organized better?
   That is, which film was the easier to follow?
7. Which film brought out the main points better?
8. If you had a choice of seeing one of these films again which one would you want to see?
9. Which film do you think you will remember longer?
10. From which film do you think you will remember the facts taught longer?
11. Write briefly what you think the main differences were between these films. Did these differences make one film better than the other? Why?

Except for question four, the first part of question five and question eleven, the trainees were required to answer "first film" (of the two they had seen), "second film", or "no difference".

The first ten questions were scored item by item in terms of the percentage of individuals selecting each of the alternatives. Question 11 was evaluated qualitatively. No measure of reliability was obtained.

Test Administration

A strenuous, and apparently successful, effort was made to keep the experimental situation, for those groups who saw just one film and took an information test, as similar as possible to the conventional military film viewing situation. The trainees were unaware that they were to be tested on the film content until after they had seen the film, nor did they know that they were participating in an experiment. No unusual motivating instructions were given. Rather, after the trainees were seated, an officer of the Ordnance Recruit Training Command greeted them in the usual way, told them they were to see a film on Cold Weather Uniforms and urged them to pay close attention since the information presented might someday in the future be of considerable importance to them. While practice may vary, this procedure is representative of the manner in which films are usually introduced in training. The experimenter observed the proceedings from the film projection booth in order to insure that proper experimental control was maintained, but no civilians were seen by the trainees.

The reason for these precautions was to reduce the possibility that the results obtained might to some extent be a function of the experimental situation itself, rather than a true reflection of the relative effectiveness of the films when used in the conventional manner.

Following the instructions groups were shown the appropriate version, i.e., base, titles or no titles, after which they were given the information test. The control group was not shown a film but told merely that they were going to be tested on their knowledge of cold weather uniforms, after which the information test was administered.

The "paired comparisons" groups, of course, were treated somewhat differently. Prior to showing either of the films it was explained to them by an officer of the Ordnance Recruit Training Command that they were going to see two films which presented the same subject matter in two somewhat different ways, after which they were to indicate their preference, if any, for one or the other on a questionnaire. It was emphasized that there were no "right" answers but, rather, they were to answer each question in terms of their own best judgment.

One group saw the base version first, followed by the titles version. For another group the order was reversed. (Actually there were two groups in the titles plus base version treatment but one group consisted of only 14 men.) The reason for reversing the order of presentation was to control for any possible effect due to order of presentation alone. As will be seen in the Results section of this report the order effect was, in fact, highly important. Testing was accomplished over a three weeks' period with four platoons tested the first week, two the second week and four the third week. No delayed recall tests were run. Table 2 summarizes the testing schedule.

TABLE 2

TESTING SCHEDULE

Week	Period*	Platoon	Company	Ord. Tng. B.	Treatment
1	1	1	F	2	Titles
1	1	2	F	2	Base
1	2	3	F	2	No Titles
1	2	4	F	2	Paired Comparisons (Base-Titles)
2	2	3	S	5	Paired Comparisons (Titles-Base)
2	2	4	S	5	Control
3	1	1	G	2	Base
3	1	2	G	2	No Titles
3	2	3	G	2	Titles
3	2	4	G	2	Paired Comparisons (Titles-Base)

* "First" and "Second" periods were the first and second periods in the afternoon, i.e., at 1300 and 1400 hours.

RESULTS

1. Information Test

Table 3 summarizes the results on the information test for the various treatments in terms of the mean scores of the groups on Area I of the Army Classification Battery, their mean Information Test scores, and their mean Information Test scores adjusted in terms of the difference between groups on Area I of the A. C. B. This adjustment was made on the basis of the correlation between the scores on Area I, A. C. B. and the Information Test, using an analysis of covariance.

TABLE 3

MEANS AND STANDARD DEVIATIONS OF SCORES ON AREA I, ARMY CLASSIFICATION BATTERY AND THE INFORMATION TEST

Treatment	Area I, A. C. B. Mean	S. D.	Information Test Mean	S. D.	Adjusted Mean Information Test
Base Version	104.08	19.57	38.11	10.20	37.72[1]
Titles Version	101.63	20.52	39.49	10.49	39.91
No Titles Version	102.80	21.95	35.96	9.46	35.99
Control	102.44	18.78	25.50	5.43	25.76

The analysis of variance of Area I, A. C. B. scores revealed no significant differences between groups on this variable.

The analysis of covariance of adjusted information test scores indicated that significant differences existed between the means of the treatments. Therefore, "t" tests of the differences between the means were performed. These are summarized in Table 4. The analysis of covariance tables are given in the Appendix.

[1] When only the base version and control groups were compared the adjusted mean of the base version was 37.98. This difference is due to the difference, probably resulting from sampling errors, in the correlation between X and Y when only the base version and control groups were considered, and the correlation when computed for the base, titles and no titles versions groups.

TABLE 4

"t" TESTS BETWEEN ADJUSTED INFORMATION TEST MEANS FOR PAIRS OF FILMS

Comparison	"t"
Base--Control	9.18**
Titles--Base	2.03*
Titles--No Titles	3.60**
Base--No Titles	1.63

* Indicates significance at the 5% level of confidence
** Indicates significance at the 1% level of confidence

It will be seen from Table 4 that:

a. There was a highly significant difference between the mean scores of those trainees who saw the base version and those who did not see any film. That is, trainees were able to learn a significant amount from the film.

b. There was a significant difference between the mean scores of those trainees who saw the titles version and those who saw the base version. That is, trainees learned more from the titles version than the base version.

c. There was a highly significant difference between the mean scores of those trainees who saw the titles version and those who saw the no titles version. That is, trainees learned more from the titles version than the no titles version.

d. There was no significant difference between the mean scores of the trainees who saw the base version and those who saw the no titles version. That is, trainees did not learn significantly more from the base version than from the no titles version.

2. Paired Comparisons

The results on the paired comparisons questionnaire seemed to depend almost entirely upon the order in which the films were seen. In general, the film seen last was rated as better regardless of whether this was the base or

titles version. Table 5 summarizes the results of the paired comparisons with respect to the first ten questions in terms of the percentage in each group who selected each of the alternatives for each question. The questions have been quoted in full on page 5. Therefore, only key phrases are repeated in the table.

It was not thought profitable to attempt a more refined or precise statistical analysis of the data beyond attempting to interpret the responses shown in Table 5, page 10.

It will be seen however that, in general, the film shown last was rated as better. However, the preference for the titles version when it was shown last was not always as strong as the preference for the base version when that film was shown last. This suggests the possibility that there may actually have been a slight preference for the base version but the data, confounded as they are by the order-of-presentation effect, do not clearly confirm this.

Of the trainees that thought Joe was portrayed as stupid or foolish in one of the films, most of them agreed that it was the base version in which he was so portrayed. However, it does not appear that this finding is particularly significant since only a small majority thought he was so portrayed and very few reported that it made any differences to them whether a soldier was made to seem foolish or stupid in a film.

An analysis of the subjective responses to Question 11 indicates that the trainees tended to rationalize their preference for the film shown last. Both groups rather correctly stated the main difference between the two films, i.e., that printed titles had been added to the titles version and that the trick effects had been deleted. However, when the titles version had been seen last the consensus seemed to be that the titles helped to organize the film, emphasized the important points and generally helped learning, while the "Pete Smith" effects were distracting; but when the base version had been seen last the titles were characterized as being boring and distracting, while the "Pete Smith" effects were said to underline the important points and make them more interesting and more easily remembered!

CONCLUSIONS

1. Trainees learned significantly more from the film Cold Weather Uniforms when the "Pete Smith" effects were deleted and printed titles, indicating the main topics to be covered, were substituted in their place. This finding lends support to the conclusions of Technical Report SDC 269-7-33 with respect to the efficacy of organizational outlines.

TABLE 5

TABULATION OF THE PAIRED COMPARISONS RESPONSES FOR THE GROUP SEEING THE BASE FOLLOWED BY THE TITLES VERSION AND THE GROUP SEEING THE TITLES VERSION FOLLOWED BY THE BASE VERSION

Question	Response	Base--Titles Group (In percents of total, N = 34)	Titles--Base Group (In percents of total, N = 61)
1. Like better	First Film	47	8
	Second Film	47	87
	No Difference	5	5
2. More interesting	First Film	47	11
	Second Film	47	82
	No Difference	5	7
3. Learned most	First Film	26	7
	Second Film	50	72
	No Difference	23	21
4. Bother you to see stupid soldier			
	Yes	26	16
	No	73	84
5a. Was Joe stupid	Yes	61	54
	No	38	46
5b. In which film was he stupid[1]			
	First Film	90	21
	Second Film	5	72
	No Difference	5	6
6. Better organized	First Film	35	23
	Second Film	64	67
	No Difference	0	10
7. Main points	First Film	17	15
	Second Film	82	69
	No Difference	0	16
8. Prefer to see again			
	First Film	41	7
	Second Film	50	83
	No Difference	8	10
9. Remember longer	First Film	35	10
	Second Film	50	74
	No Difference	14	16
10. Remember facts taught			
	First Film	23	16
	Second Film	68	77
	No Difference	9	7

[1] The number of trainees upon which these percentages are based were 21 and 33 respectively.

2. There was no significant difference in learning when the "Pete Smith" effects were deleted and blank film was substituted in their place.

3. Trainees who saw Cold Weather Uniforms learned a significant amount from this film as compared to those who did not see the film.

4. Trainees who saw two films which covered the same subject matter treated in somewhat different ways tended to prefer the film they saw last regardless of which one it was. The hypothesized reason for this is that the film shown second was essentially a repetition of the film shown first (insofar as the important facts are concerned) and that trainees found the facts clearer and easier to learn upon the second showing. They then attributed this subjective experience, which appears actually to be the result of repetition, to some apparent difference between the films.

RECOMMENDATIONS

1. The additional cost and effort of including "Pete Smith" effects in a film should be avoided. They cannot be justified on the basis of factual learning nor is there any clear evidence that they add to the interest or motivating effect of a film.

2. The inclusion of printed titles, probably because they serve as a kind of repetition and emphasize the main points, increases learning from a film and is to be recommended.

3. Blank film inserted between sequences can be used to cushion the possible disturbing effect of "jump cuts" without significant loss in learning. Therefore this device may be used to some extent, not yet specified, where considerable time and effort would be needed to match action in order to avoid "jump cuts." However, titles also serve the same function and appear to add to the teaching effectiveness of the film.

4. The method of paired comparisons for the subjective evaluation of similar films should only be used, if at all, with extreme caution. It is probable that the film seen last will be the one most preferred.

Presented below are the analysis of covariance tables from which the results were derived. In the tables, "X" represents scores on the information test; "Y" represents Area I, A.C.B. scores.

TABLE 6

ANALYSIS OF COVARIANCE OF SCORES ON AREA I, A.C.B. AND THE INFORMATION TEST FOR THE BASE VERSION AND CONTROL GROUPS

Source	ΣX^2	dof	MS	F	$\Sigma X^2 - \frac{(\Sigma XY)^2}{\Sigma Y^2}$	dof	MS	F
Between Groups	5283.5478	1	5283.5478	65.92**	4948.3500	1	4948.35	84.26**
Within Groups	11782.2777	147	80.1515		8574.8595	146	58.73	
Total	17065.8255	148			13523.2095	147		

Source	ΣY^2	dof	MS	F	ΣXY	$\frac{(\Sigma XY)^2}{\Sigma Y^2}$	r^2_{xy}
Between Groups	89.4405	1	89.4405	--	687.4325	5283.5509	
Within Groups	55541.6735	147	377.8345		13347.1111	3207.4182	.27
Total	55631.1140	148			14034.5436	3542.6160	

** Indicates significance at the 1 per cent level of confidence

TABLE 7

ANALYSIS OF COVARIANCE OF THE SCORES ON AREA I, A.C.B. AND THE INFORMATION TEST FOR THE BASE, TITLES AND NO TITLES VERSIONS

Source	ΣX^2	dof	MS	F	$\Sigma X^2 - \frac{(\Sigma XY)^2}{\Sigma Y^2}$	dof	MS	F
Between Versions	581.6470	2	290.8235	2.85	700.9218	2	350.4609	6.47**
Within Versions	28393.3560	278	102.1343		15011.3554	277	54.1926	
Total	28975.0035	280			15712.2772	279		

Source	ΣY	dof	MS	F	ΣXY	$\frac{(\Sigma XY)^2}{\Sigma Y^2}$	r^2_{xy}
Between Version	278.7966	2	139.40	--	-132.9744	63.4232	
Within Versions	120324.7829	278	432.82		40127.1270	13382.0006	.47
Total	120603.5800	280			39994.1530	13262.7263	

** Indicates significance at the 1 per cent level of confidence.

In Table 6 on the preceding page it will be seen that there is a highly significant difference between the base version and control groups on the basis of Information Test scores. It will be seen also in Table 6 that no significant difference was found between the groups on the basis of Area I, A.C.B. scores.

In Table 7 on the preceding page it will be seen that the F-ratio for the Information Test scores was highly significant after the mean squares were adjusted to reflect the correlation between the Information Test and Area I, A. C. B. scores. In Table 7 it will be seen also that no significant difference was found between groups on the basis of Area I, A. C. B. scores.